



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification <sup>6</sup> :</b> <b>G01N 33/553, C12Q 1/00, C08G 83/00,</b> <b>C08B 37/02</b>	<b>A3</b>	<b>(11) International Publication Number:</b> <b>WO 99119276</b> <b>(43) International Publication Date:</b> 22 April 1999 (22.04.99)						
<p><b>(21) International Application Number:</b> PCT/US98/2 1804</p> <p><b>(22) International Filing Date:</b> 14 October 1998 (14.10.98)</p> <p><b>(30) Priority Data:</b></p> <table border="0"> <tr> <td>60/061,805</td> <td>14 October 1997 (14.10.97)</td> <td>US</td> </tr> <tr> <td>09/172,921</td> <td>9 October 1998 (09.10.98)</td> <td>US</td> </tr> </table> <p><b>(71) Applicant</b> (<del>for</del> all designated States except US): ALNIS, LLC [US/US]; Suite 258, 1933 Davis Street, San Leandro, CA 94577 (US).</p> <p><b>(72) Inventors; and</b>  <b>(75) Inventors/Applicants</b> (<del>for</del> US only): SOANE, David, S. [US/US]; 109 King Avenue, Piedmont, CA 94610 (US). BARRY, Stephen, E. [US/US]; 300 Monte Vista Avenue #304, Oakland, CA 94611 (US). GOODWIN, Andrew [US/US]; 446 42nd Street, Oakland, CA 94609 (US). OFFORD, David, A. [US/US]; 4267 Mabel Avenue, Castro Valley, CA 94546 (US). PERROT, Michael, G. [US/US]; 1516 Waller Street, San Francisco, CA 94117 (US).</p> <p><b>(74) Agents:</b> JOHNSTON, Madeline, I. et al.; Morrison &amp; Foerster LLP, 755 Page Mill Road, Palo Alto, CA 94304-1018 (US).</p>		60/061,805	14 October 1997 (14.10.97)	US	09/172,921	9 October 1998 (09.10.98)	US	<p><b>(81) Designated States:</b> AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p><b>Published</b>          With international search report.          Before the expiration of the time limit for amending the claim: and to be republished in the event of the receipt of amendments.</p> <p><b>(88) Date of publication of the international search report:</b>          19 August 1999 (19.08.99)</p>
60/061,805	14 October 1997 (14.10.97)	US						
09/172,921	9 October 1998 (09.10.98)	US						
<p><b>(54) Title:</b> MOLECULAR COMPOUNDS HAVING COMPLEMENTARY SURFACES TO TARGETS</p> <div data-bbox="535 1113 1071 1638" data-label="Chemical-Block"> </div> <p><b>(57) Abstract</b></p> <p>Synthetic polymer complements (SPCs) are provided, as well as methods for their synthesis and use. The SPCs may have surfaces that include functional groups that are complementary to surface sites of targets such as nanostructures or macromolecular targets, and may be capable of specifically interacting with such targets. The positions of the functional groups in one embodiment are stabilized by a polymer network. The SPCs are formed by contacting the target with a set of monomers which self-assemble on the target, and then are polymerized into a network to form the synthetic polymer complement. At least a portion of the surface of the resulting SPC thus may include an imprint of the target. The complex of the SPC and the target may be the desired product. Alternatively, the target is released, for example, by controllably expanding and contracting the cross-linked network. The SPC is isolated and used in many applications.</p>								

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# INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 98/21804

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 G01N33/553 C12Q1/00 C08G83/00 C08B37/02

According to International Patent Classification (IPC) or to both national classification and IPC

## 3. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 G01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	M MURATA, S HIJIYA, M MAEDA, M TAKAGI: "Template-Dependent Selectivity in Metal Adsorption on Phosphoric Diester-Carrying Resins Prepared by Surface Template Polymerization Technique" BULLETIN OF THE CHEMICAL SOCIETY OF JAPAN, vol. 69, no. 3, 1996, pages 637-642, XP002105145 see page 637 - page 638	1,2,4, 18,19, 22,32, 34,37, 50-52
X	US 5 310 648 A (ARNOLD FRANCES H ET AL) 10 May 1994	1,2,4, 18,19, 22,32, 34,37, 50-52
A	see the whole document --- -/--	17,30,45

☒ Further documents are listed in the continuation of box C

☒ Patent family members are listed in annex.

### \* Special categories of cited documents \*

"A" document defining the general state of the art which is not considered to be of particular relevance

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"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance, the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

9 June 1999

Date of mailing of the international search report

23/06/1999

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# INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 98/21804

## Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	S A PILETSKY, H S ANDERSSON, I A NICHOLLS: "The rational use of hydrophobic effect-based recognition in molecularly imprinted polymers" JOURNAL OF MOLECULAR RECOGNITION, vol. 11, no. 1-6, 1998, pages 94-97, XP002105146 see the whole document ---	1,2,8, 10,19, 24,34,39
	X X ZHU, K BANANA, R YEN: "Pore-size control in cross-linked polymer resins by reverse micellar imprinting" MACROMOLECULES, vol. 30, no. 10, 1997, pages 3031-3035, XP002105147 ---	1,2,4, 18,19, 22,32, 34,37, 50-52
	US 4 770 906 A (HARWELL JEFFREY H ET AL) 13 September 1988  see column 6 - column 9 ---	1,2,4, 18,19, 22,32, 34,37, 50-52
	WULFF G: "MOLECULAR IMPRINTING IN CROSS-LINKED MATERIALS WITH THE AID OF MOLECULAR TEMPLATES - A WAY TOWARDS ARTIFICIAL ANTIBODIES" ANGEWANDTE CHEMIE, INTERNATIONAL EDITION, vol. 34, no. 17, 15 September 1995, pages 1812-1832, XP000524863 cited in the application see the whole document ---	1-52
	KEMPE M ET AL: "Molecular imprinting used for chiral separations" JOURNAL OF CHROMATOGRAPHY A, vol. 694, no. 1, 3 March 1995, page 3-13 XP004023308 see the whole document ---	1-52
A	N KAMIYA, M GOTO: "Preparation of surfactant-coated lipases utilizing the molecular imprinting technique" JOURNAL OF FERMENTATION AND BIOENGINEERING, vol. 85, no. 2, 1998, pages 237-239, XP002105148 see the whole document ---	1,2,4, 18,19, 22,32, 34,37, 50-52
	DE 198 23 432 A (BAYERL THOMAS PROF DR ;DECHER GERO PROF DR (DE); BRAUNSCHWEIG THOM) 11 March 1999 see the whole document -----	1-52

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 98/ 21804

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out. specifically:  
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application. as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

# INTERNATIONAL SEARCH REPORT

International Application No. PCT/ US 98/21804

## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Claims not searched: 1-3, 5-7, 11-16, 19-21, 23, 25-29, 31, 33-36, 38, 40-44, 46-49, 51 (all partially unsearched)

The general terms "head group" and "crosslinking group" of independent Claims 1, 19 and 34, for which examples of extremely broad chemical scope are provided in Claims 15-16, 28-29, and 43-44, are so unclear as to render the above-mentioned claims unclear with respect to the scope of the matter for which protection is sought. These claims fail to comply with the requirements of Article 6 to such an extent that a complete meaningful search could not be carried out. Claims 1-3, 5-7, 11-16, 19-21, 23, 25-29, 31, 33-36, 38, 40-44, 46-49 and 51 were all searched in the light of Claims 4, 8-10, 17-18, 22, 24, 30, 32, 37, 39, 45, 50 and 52.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 98/21804

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US 5310648	A	10-05-1994	AU WO	1461792 A 9213447 A	07-09-1992 20-08-1992
US 4770906	A	13-09-1988	US US	4900627 A 5106691 A	13-02-1990 21-04-1992
DE 19823432	A	11-03-1999	NONE		

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